Haseeb-Ullah
ID # 16314
Subject * Applied physics
Summer Semester paper.
Mid term paper:

(Question 1)

Part b:-

Convert the following.

(1) 257,600 meters to kilometers.

$$\frac{257,600}{1000}$$

$$= \boxed{257.6 \text{ kilometers.}} \text{ K}$$

(2) 58,300 milliliters to liters.

$$\frac{58,300}{1000}$$

58.3 liters (l)

(3) 87,421 Centimeters to meters

$$\frac{87,421}{100}$$

874.21 meters (m)

(4) 869 Kilogram to grams.

$$869 \times 1000$$

= 869000 gram (g)

(5) 10^4 milligram to gram

$$\frac{10000}{1000}$$

= 10 gram (g)

(Question 1:-)

(Part a:-)

keeping in view SI units, Solve the following.

① A body's temperature is 143.4°C. what is this temperature in kelvin.

°C = 143.4

K = ?

Sol

K = °C + 273

= 143.4 + 273

K = 416.4 k

② An item has temperature of 2596 degree K. what is its temperature in Celsius.

K = 2596

°C = ?

Sol.

°C = K - 273

= 2596 - 273

°C = 2323 C

③ mass = 4.76 g
Volume = 0.54 cm^3
Calculate the density.

Sol

fomula ⇒ density = $\frac{\text{mass}}{\text{Volume}}$

$= \frac{4.76\,g}{0.54\,cm^3}$

density = 8.81 g/cm^3

(Question 2:-)

(Part a :-)

write the difference b/w the bellow terms.

Distance	Displacement
The length of the actual path traversed	The shortest or straight distance covered by a

by a body in motion is called distance.

SI unit is meter (m)
It is a Scalar quantity.

Example:-
Distance b/w two chair is 5 feet.

moving body from initial position to final position.

SI unit is meter (m)
It is a ~~vet~~ vector quantity.

Example:-
a body moves from point (A) to (B) and he change this position is called displacement.

Speed

The distance covered by a body b/w two points in a unit time (t) is called speed.

SI unit is m/s
It is a Scalar quantity.

Average Speed

The total distance covered by a moving body divided by total time taken to cover distance is called average speed.

SI unit is m/s
It is also Scalar quantity.

Mathematically:-

$$\text{Speed} = \frac{\text{distance Covered}}{\text{time take.}}$$

$$V = \frac{S}{t}$$

Example:-

If a car moving at a speed of 45 km/hr

Mathematically:-

$$\text{Average Speed} = \frac{\text{Total distance Covered}}{\text{total time taken}}$$

$$\langle V \rangle = \frac{\Delta S}{\Delta t}$$

Example:-

A car reached to islamabad (155 km) at time of (3hours 30min) So this average speed is 44.3 km/h

Positive acceleration

Increase in a speed is called positive acceleration.

It is a vector quantity

Example:-

When an object is moving upward. This mean it is in positive acceleration.

Negative acceleration.

Decrease in a speed is called negative acceleration.

It is also vector quantity.

Example:-

When an object is falling down. This mean it is an negative acceleration.

(Question 2):-

(Part b):-

A car is moving with a velocity of 8 m/s. The driver applied brakes and the car come to stop after covering a distance of 19m. Calculate its acceleration?

Given data :-

Initial velocity , $V_i = 8$ m/s
final velocity , $V_f = 0$ m/s
Distance , $S = 19$m
Acceleration , $a = ?$

Solution:

We know that

$$2as = V_f^2 - V_i^2$$

So

$$a = \frac{V_f^2 - V_i^2}{2s}$$

Putting values

$$= \frac{(0)^2 - (8)^2}{2(19)}$$

$$a = -\frac{64}{38}$$

$$\boxed{a = -1.684 \text{ m/s}^2}$$

Question 3):-

(part a):-

Newton First Law of Motion:-

Statement:

This law state that every object continues in its state of rest or uniform motion in a straight line unless it is acted upon by an external force.

Mathematically:-

$F = 0$, then $v =$ Constant $\quad a = 0$

The first law of motion has two parts.

First Part of Newton first Law of motion:-

The first part of law state that a body at rest will remain at rest if no net force act on it.

Example:-

When a car stop on a parking and cannot change position so a force is apply to change its position.

Second Part of newton first Law motion:-

The second part of the law state that the the body in motion will continue to move in a straight line with uniform speed if No Net force act on it.

Example of first Law of motion:-

If you are standing in a bus. So you are in Contact with bus. But when suddenly bus stop. So you fall forward due to inertia.

Newton Second Law of motion :

Statement :-

A net force act on a body it produces acceleration in the direction of the net force. The acceleration is the direction of the net force. The acceleration is directly proportional to the net force and inversly to the mass of the body.

Mathematically :

$a \propto F$ directly proportional to the force & inversly proportional to the mass of body.

$$a \propto F \quad \times \quad a \propto \frac{1}{m}$$

$$a \propto \frac{F}{m}$$

$$a = k \frac{F}{m} \qquad k = 1$$

$$a = (1) \frac{F}{m}$$

$$a = \frac{F}{m}$$

$$\boxed{F = ma}$$

Example of Second Law of motion:-

If you use a same force to push a truck and push a car, the car will have more acceleration then truck. Because car has lesser mass then truck.

Question 3):-

(Part b):-

Third Law of motion:-

Newton ~~fa~~ third Law of motion state that every action has equal and opposite reaction. ~~if~~ F_{AB}

If F_{AB} is a force of a body A acting on B and F_{BA} is force by B on body A.

Mathematical form :-

Where, F_{AB} is an action on B while F_{BA} is reaction of B on A. Negative sign indicates that force acting on body A is in opposite direction to the force which is acting on body B.

Examples:-

(1) When you jump off a small rowing boat into water, [illegible] to will push your self forword towords. the water, the same force you used to push forword will make the board move backwordo.

(2) When air rushes out of ballon, the opposite reaction is that the ballon flies up.

(3) When you drive off a diving board, you push down on the spring board, you push down, on the spring board, the board springs back & forces you into the air.